

CLAIMS

What is claimed is:

1. A method of coating a carbon article with a metal by cyclic voltammetrically electrodepositing the metal on the carbon article, thereby forming a metal coating on the carbon article.

2. The method according to claim 1, wherein said electrodepositing step includes immersing the carbon article in a solution containing a reducible metal compound.

3. The method according to claim 2, wherein said electrodepositing step further includes subjecting the carbon article and the solution to varying electrical potentials.

4. The method according to claim 3, wherein said subjecting step includes varying the electrical potential from about zero volts to about -1.0 volts with a rate of potential change of about 100 millivolts per second.

5. The method according to claim 4, wherein said method further includes repeating the subjecting step until a sufficient metal coating is deposited on the carbon article.

6. A metal-coated carbon article formed by the method of claim 1.

7. The metal-coated carbon article according to claim 6, wherein said carbon article is selected from the group consisting essentially of carbon paper, carbon rods, and carbon electrodes.

8. The metal-coated carbon article according to claim 7, wherein said carbon article is an electrode.

9. The metal-coated carbon article according to claim 8, wherein said electrode is a fuel cell electrode.

10. The metal-coated carbon article according to claim 6, wherein said metal is selected from the group consisting essentially of platinum, gold, silver, palladium, ruthenium, rhodium, and iridium.

11. The metal-coated carbon article according to claim 10, wherein said metal-coated carbon article is a platinum-coated carbon electrode.

12. The metal-coated carbon article according to claim 11, wherein said coating is present in an amount less than about 0.1 mg/cm^2 .

13. A metal-coated carbon article comprising:
a carbon article; and
a metal coating disposed on an exterior surface of said carbon article, said coating being present in an amount less than about 0.1 mg/cm^2 .

14. The metal-coated carbon article according to claim 13, wherein said carbon article is selected from the group consisting essentially of carbon paper, carbon rods, and carbon electrodes.

15. The metal-coated carbon article according to claim 14, wherein said carbon article is an electrode.

16. The metal-coated carbon article according to claim 15, wherein said electrode is a fuel cell electrode.

17. The metal-coated carbon article according to claim 13, wherein said metal is selected from the group consisting essentially of platinum, gold, silver, palladium, ruthenium, rhodium, and iridium.

18. The metal-coated carbon article according to claim 16, wherein said metal-coated carbon article is a platinum-coated carbon electrode.

19. The metal-coated carbon article according to claim 13, wherein said coating is present in an amount less than about 0.08 mg/cm^2 .

20. The metal-coated carbon article according to claim 13, wherein said coating is present in an amount less than about 0.05 mg/cm^2 .

21. The metal-coated carbon article according to claim 13, wherein said coating is present in an amount less than about 0.03 mg/cm^2 .

22. The metal-coated carbon article according to claim 13, wherein said coating is capable of reducing oxygen in phosphoric acid, neutral, and basic media.

23. The metal-coated carbon article according to 22, wherein said metal-coated carbon article are capable of rendering active platinum surfaces for charge accumulation through hydrogen deposition and release.

24. A method of coating a carbon article with a metal by controlled potentially electrodepositing the metal on the carbon article, thereby forming a metal coating on the carbon article.